

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 55

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CELIA BONAVENTURA,
JOSEPH BONAVENTURA, and IRVING R. HOOPER

Appeal No. 95-1779
Application 07/683,130¹

HEARING: February 10, 1999

Before WILLIAM F. SMITH, GRON, and LORIN, Administrative
Patent Judges.

GRON, Administrative Patent Judge.

¹ Application for patent filed April 10, 1991. According to applicants, this application is a continuation of Application 07/464,699, filed January 16, 1990, abandoned; which is a continuation of Application 06/744,547, filed June 14, 1985, abandoned.

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DECISION ON APPEAL UNDER 35 U.S.C. § 134

This is an appeal under 35 U.S.C. § 134 from an examiner's rejections of Claims 1-5, 13, 23-24, and 26-31, all claims pending in this application.

Introduction

Claims 1-5, 13, 23-24, and 26-31 stand rejected under 35 U.S.C. § 103 as being unpatentable in view of the disclosure of "Christie. Abstract No. 0062363 210-05970 of Dialog File No. 44. 'Control of Fouling Organisms,' [Presented at: Marine Fouling Seminar, London (UK)]. April 23, 1979".² Claims 1-5,

² It is not clear from the record whether the examiner is relying on Christie's Abstract for the subject matter its describes in a printed publication under 35 U.S.C. § 102(a) or 102(b) or for subject matter which was known by others in this country as a result of its presentation at a London (UK) conference. If the examiner is relying on the printed publication, its publication date has not been established. The subject matter described in the abstract was merely presented at a conference in London (UK) on April 23, 1979. The conference date is the only date the examiner associates with the reference (Examiner's Answer (Ans.), p. 3). On the other hand, if the examiner is relying on the prior knowledge "by others in this country" of the subject matter presented by Christie at the London (UK) conference on April 23, 1979, under section 102(a), the examiner has not established that the subject matter was known "in this country" prior to June 14, 1985. While the cited abstract refers to a four page article entitled "Control of Fouling
(continued...)

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13, 23-24, and 26-31 stand rejected under 35 U.S.C. § 103 as being unpatentable in view of the combined teachings of either Christensen et al. (Christensen), U.S. 4,055,467, patented October 25, 1977, or Hatcher et al. (Hatcher), U.S. 3,773,623, patented November 20, 1973, and Trevan, Immobilized Enzymes, John Wiley & Sons, New York, pp. 66-70 (1980). Claims 1 and 27 are representative of the subject matter claimed and read:

1. A method for preventing fouling of an aquatic apparatus by an aquatic organism without contamination of the environment, which comprises:

applying a composition containing an inert matrix having an enzyme chemically bonded thereto, to a surface of said apparatus, wherein said chemically bonded enzyme is capable of hindering attachment of said organism to said surface while applied to said surface; and

contacting at least part of said surface with an aquatic environment which contains an aquatic organism capable of fouling said aquatic apparatus and is one aquatic environment selected from the group consisting of natural fresh-water environments, estuary aquatic environments, sea waters, cooling tower systems, fresh water

piping systems, salt water piping systems, ponds, lakes, harbors, dredged channels, and desalination systems, thereby

²(...continued)
Organisms,"
which was published in 1979 in a book entitled Conference Book of International Paint Marine Coatings, (London, 1979)(of record), the examiner has continually rejected appellants' claims over the abstract only. However, for purposes of this appeal, we shall presume that the abstract is prior art under section 102(b) and consider its teaching in light of the four page, 1979 publication it purports to summarize.

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hindering attachment of said organism to said surface by interfering with said organisms mechanisms for attachment to submerged surfaces.

27. A method for preventing fouling of an aquatic apparatus by an aquatic organism without contamination of the environment, which comprises:

coating a surface of said apparatus with a composition containing an inert matrix and a biologically active enzyme chemically bonded to said inert matrix, wherein said enzyme is capable of hindering attachment of said organism to said surface while coated on said surface, wherein said apparatus is one member selected from the group consisting of ship hulls, pilings, glass and other transparent observation windows, sonar domes, water-conducting pipes, cooling towers, ponds, pumps, and valves.

Discussion

1. Section 103 in view of Christie's teaching

With regard to the teaching in Christie's Abstract, the examiner acknowledges (Examiner's Answer (Ans.), p. 4):

While the reference suggests the use of an enzyme system in combination with paint marine coatings, the reference is silent as to how the enzyme system is incorporated into the coating.

However, the examiner maintains the rejection because (Ans., pp. 4-5, bridging para.):

. . . it is notoriously well known in the art to immobilize enzymes on a solid surface so as to be in

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contact with a liquid (e.g. an enzyme reactor). As a result, it would have been obvious to one of ordinary skill in the art to determine the optimum manner in which the enzyme of Christie is incorporated into the marine coating while maintaining the required antifouling function

discussed by the reference of Christie. Whether the enzyme is physically entrapped or chemically attached would have been merely an obvious matter in design choice based on considerations such as the specific enzyme to be immobilized, the material of the surface to be coated, the material of the coating and/or the environment in which the surface is to be exposed.

It is apparent to this panel that the examiner's rejection is based on impermissible hindsight. We find no indication in the references cited by the examiner that the manner in which the enzyme of an enzymatic antifouling marine coating is incorporated in the coating is a result effective variable. Moreover, we find no prior art teaching that "[w]hether the enzyme is physically entrapped or chemically attached would have been merely an obvious matter in design choice based on considerations such as the specific enzyme to be immobilized, the material of the surface to be coated, the material of the coating and/or the environment in which the surface is to be exposed." Furthermore, we find no reasonable suggestion in the cited prior art which would have led persons having ordinary skill in the art to chemically bond an enzyme in an enzymatic antifouling marine coating to the inert matrix

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of the coating. Finally, Christie states on page 3 of the full text of his article (of record and attached hereto):

Enzyme systems which are capable of attacking the proteinaceous adhesives produced by fouling organisms have been suggested but are unlikely to be developed due to cost and to practicability under service conditions.

2. Section 103 in view of Christensen or Hatcher and Trevan

Christensen and Hatcher describe processes for preventing fouling of marine surfaces which comprise adding an enzyme to industrial waters (Christensen, col. 1, l. 30-43; Hatcher, col. 1, l. 64, to col. 2, l. 9). According to the examiner (Ans., p. 6), "[t]he instant claims differ by reciting that the enzyme is immobilized to the surface of the structure exposed to the environment" The examiner adds (Ans., p. 6),

"Trevan discloses that it is conventional in the art to immobilize enzymes so as to render them more stable and allow them to be easily recovered and/or re-used (See page 66)."

In view of the combined teaching, the examiner concludes (Ans., pp. 6-7, bridging para.):

[I]t would have been obvious to one of ordinary skill in the art to immobilize the enzymes of Christensen . . . or Hatcher . . . on the surfaces of the process equipment as suggested by Trevan for the known and expected advantages

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of preventing loss of the enzyme (allowing its reuse) and increased stability of the enzyme.

Thereafter, the examiner repeats the arguments made in support of the rejection in view of Christie's teaching.

Frankly, since neither Christensen or Hatcher appear to have had any interest in immobilizing the enzymes which they added to industrial waters to prevent biological slimes from depositing on the marine surfaces, we find no reasonable basis in the combined prior art teachings to (1) immobilize the enzymes on the marine surfaces to prevent their loss or improve their stability, or (2) chemically bond the active enzymes to an inert matrix of any marine coating applied to marine surfaces. As said in Ex parte Tanksley, 37 USPQ2d 1382, 1386 (Bd. Pat. App. & Int. 1994):

With respect to the rejections under 35 U.S.C. § 103,
we find that the cited prior art provides no suggestion which would have led a person having ordinary skill from "here to there" The mere fact . . . that the prior art could be so modified would not have made the modification obvious unless *the prior art* suggests the desirability of the modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)

Conclusion

We reverse the examiner's rejection of Claims 1-5, 13, 23-24, and 26-31 under 35 U.S.C. § 103 as being unpatentable

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in view of Christie.

We reverse the examiner's rejection of Claims 1-5, 13, 23-24, and 26-31 under 35 U.S.C. § 103 as being unpatentable in view of the combined teachings of Christensen or Hatcher, and Trevan.

REVERSED

	William F. Smith)	
	Administrative Patent Judge)	
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	Teddy S. Gron)	BOARD OF
PATENT	Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
)	
	Hubert C. Lorin)	
	Administrative Patent Judge)	

tdc

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Oblon, Spivak, McClelland,
Maier & Neustadt
Fourth Floor
1755 Jefferson Davis Highway
Arlington, VA 22202